Paper No. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HAN S. UHM

Appeal No. 2000-1090
Application No. 09/086,990

ON BRIEF

Before KIMLIN, LIEBERMAN, and PAWLIKOWSKI, Administrative Patent Judges.

LIEBERMAN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the refusal of the examiner to allow claims 1 and 3 through 10, and claim 2 as amended subsequent to the final rejection.

THE INVENTION

The invention is directed to a method of eliminating contaminants from a gaseous emission by exposing the gaseous emission to a plasma in a reaction chamber. Electrical energy is supplied to the reactor chamber so as to result in generation of plasma by corona

discharge. Additional limitations are provided in the following illustrative claim.

THE CLAIM

Claim 1 is illustrative of appellant's invention and is reproduced below:

> 1. In a method of eliminating contaminants from a gaseous emission by generation of a plasma to which the gaseous emission is exposed for promoting chemical reaction of the contaminants, the improvement residing in the steps of: conducting the gaseous emission during discharge thereof through a reactor chamber to which said plasma is confined; supplying electrical energy to the reactor chamber for establishment of an electrical field therein; and controlling said supply of the electrical energy to the reactor chamber for breakdown of the electrical field therein to effect said generation of the plasma by corona discharge within the reactor chamber.

THE REFERENCES OF RECORD

As evidence of anticipation and obviousness, the examiner relies upon the following references:

Taylor et al. (Taylor)	5,366,701	Nov. 22, 1994
Breault et al. (Breault)	5,458,748	Oct. 17, 1995

THE REJECTIONS

Claims 1 and 3 through 8 stand rejected under 35 U.S.C. § 102(b) or (e) as being clearly anticipated by Breault.[1]

Claims 2, 9, and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Breault.

Claims 7 through 10 stand rejected under 35 U.S.C. § 103(a) as being

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[1]We consider only the rejection under Section 102(e) as it has not been established on the record before us that a rejection may be entered over Breault under Section 102(b).

unpatentable over Taylor in view of Breault.

OPINION

We have carefully considered all of the arguments advanced by the appellant and the examiner and agree with the examiner for the reasons set forth below that the rejection of claims 1through 10 are well founded. Accordingly, we affirm the rejections.

As an initial matter, the appellant has divided the claims rejected over the Breault rejection in two groups. The first group includes claims 1 and 3-6. The second group includes claim 2. See Brief, page 3. Claims 7 though 10 have been grouped only with respect to the rejection over Taylor. Id. Accordingly, we have followed the grouping established by the examiner in accordance with each of the rejections over Breault. We group claims 7 and 8 with claims 1 and 3-6 and claims 9 and 10 together with claim 2. Accordingly, with respect to the rejection over Breault, Group 1 includes claims 1 and 3 through 8. Group 2 includes claims 2, 9, and 10.

The Rejection over Breault

It is appellant's position that, "any careful review of the Breault et al. patent will reveal that no portions thereof expressly refer to generation of plasma by corona discharge control of an electrical field within a reactor chamber in order to promote therein the contaminant cleansing chemical reaction." See Brief, page 4. We disagree.

Breault is directed to a nitrogen oxide environment effective reduction apparatus. See column 1, lines 14-15. The apparatus of Breault further provides for the removal of

sulfur compounds including SO_2, H_2S, CH_3SH, $CH_3S_2CH_3$ and other gases contained in flue or off gas. See column 1, lines 26-31. Based on these findings we conclude that Breault is directed to a method of removing contaminants from a gaseous emission as required by the claimed subject matter.

We find that Breault provides a coronal catalyst activatable by high voltage wherein the emission gas has a residence time in the coronal catalyst of from about 0.2 to about 5 seconds or more. See column 2, lines 42-47 and column 2, lines 18-40. We find that the coronal catalyst or coronal discharge is defined by an environment having dispersed electron charge or electric field with a flow of electrons through a gas enhancing electron density of the flow path, wherein such charge dispersion and electron concentration augments electron-molecule collision as compared to molecular-molecular collision. See column 6, line 64 to column 7, line 4 and column 12, line 61 to column 13, line 12. We find that the corona catalyst is a reduction phenomena based upon the energy input of the corona catalyzed reactions. See column 12, lines 23-25. We further find that the term corona and low energy gaseous plasma is used interchangeably. See column 12, lines 54-60. Patentee states therein that, "[a] unique aspect of the process is found in the generation of a low energy gaseous plasma or corona within a chemical reactor." We conclude therefrom that the gas passes through a chemical reactor which confines a plasma as required by the claimed subject matter. Our conclusion is further supported by reference

to the schematic of Figure 2 which shows a heated gaseous emission introduced into a furnace through a 1 inch diameter tube **20**. See column 15, lines 5-6. A coronal discharge area is located within the furnace and is energized by power supply **26** connected to outer electrode **28** and inner electrode **30**. Outlets are provided after treatment of the gaseous emission. See column 15, lines 1-20. The gases to be treated include sulfur dioxide, carbon dioxide, nitrogen dioxide, nitrogen and oxygen. See Figure 2. Furthermore, our position is supported by reference to Figure 4(a) through (e) which discloses wherein flue gas **402** is directed into a reactor **406** having reactor tubes **408** with the requisite electrodes to provide the coronal discharge or plasma. See Column 18, lines 28- 63.

Based upon the above findings and analysis we conclude that the teachings of Breault anticipate the claimed subject matter. Accordingly, we sustain the rejection on the grounds of anticipation.

As for those claims rejected on the grounds of obviousness, we find that Breault specifically discloses exemplification at a temperature of 220°F which is substantially in excess of 300°K required by claims 2, 9, and 10. See the Table in column 15, and column 17, lines 47-48. We further agree with the examiner's finding of 60°F to 1000°F at column 11, line 34. We further find those operating parameters including temperature are disclosed at column 11, lines 33-48, and temperature parameters are disclosed in the

Table at column 21 together with other characteristics of the reactor including gas flow

conditions and gas composition. We conclude that it would have been obvious to one of ordinary skill in the art to have conducted the gaseous emission at a temperature within the scope of the claimed subject matter.

Based upon the above findings and analysis, we further conclude that the examiner has established a prima facie case of anticipation with respect to claims 1 and 3 through 8 and a prima facie case of obviousness with respect to claims 2, 9, and 10.

A discussion of the reference to Taylor is not needed in reaching our decision, inasmuch as we have found that the Breault reference also relied upon in the rejection of claims 7 through 10 over Taylor in view of Breault, in and of itself is sufficient to either anticipate or render obvious each of the above claims.

DECISION

The rejection of claims 1 through 10 is affirmed.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

EDWARD C. KIMLIN Administrative Patent Judge	)	
PAUL LIEBERMAN Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
BEVERLY A. PAWLIKOWSKI Administrative Patent Judge	)	

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